

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1. - 45. (cancelled)
46. (currently amended) A method for obtaining information about a subject, comprising the steps of:
 - providing a magnetic resonance scanner;
 - providing an atlas having magnetic resonance data including tissue type prior probability derived from at least one other subject;
 - processing information received from said scanner pertaining to said subject;
 - reading said atlas; and
 - determining alignment of said magnetic resonance scan to obtain a specific geometry of a subsequent magnetic resonance scan.
47. (original) The method of claim 46, further comprising the steps of:
 - communicating alignment data from said processor to said scanner; and
 - automatically aligning said magnetic resonance scan to obtain said specific geometry of a subsequent magnetic resonance scan by the use of said alignment data.
48. (original) The method of claim 46, wherein said step of providing an atlas having magnetic property values derived from at least one other subject involves data derived from a plurality of subjects.

49. (cancelled)

50. (currently amended) A method of using a processor for obtaining information about a subject, comprising the steps of:

providing magnetic property values from a scanner ~~corresponding to tissue types and~~ pertaining to said subject;

providing an atlas having at least two magnetic property values for at least one corresponding voxel derived from at least one other subject; and

labeling by said processor of tissue types of a tissue corresponding to said magnetic resonance property values pertaining to said subject by the use of said atlas having said magnetic resonance values derived from at least one other subject.

51. (original) The method of claim 50, wherein said step of providing an atlas having magnetic property values derived from at least one other subject involves data derived from a plurality of other subjects.

52. (currently amended) A method for creating an atlas, comprising the steps of:
providing a first magnetic resonance modality volume pertaining to a subject and divided into voxels;

correcting distortion of said first magnetic resonance modality volume; and
recording a magnetic property value in a node of said atlas corresponding to a voxel of said first magnetic resonance modality volume.

53. (cancelled)

54. (original) The method of claim 52, further comprising the steps of:
providing a second magnetic resonance modality volume pertaining to a second subject and divided into voxels;
correcting distortion of said second magnetic resonance modality volume; and
updating said magnetic property data in said node of said atlas corresponding to a voxel of said second magnetic resonance modality volume.

55. (original) The method of claim 52, wherein said step of correcting involves the correction of distortion caused by at least one of the group consisting of chemical shift, magnetic susceptibility, per-acquisition motion, gradients non-linearity, main magnetic field non-homogeneity, eddy currents, and Maxwell effects.

56. (original) The method of claim 52, further comprising the steps of:
providing a plurality of magnetic resonance modality volumes pertaining to a plurality of subjects and each of said plurality of magnetic resonance modality volumes divided into voxels;
correcting distortion of each of said plurality of magnetic resonance modality volumes; and
updating said magnetic property value in said node of said atlas corresponding to a voxel of each of said plurality of magnetic resonance modality volumes;
wherein said magnetic property value in said node of said atlas includes statistical

data.

57. (original) A method for creating an atlas, comprising the steps of:

- providing a first magnetic resonance modality volume pertaining to a subject and divided into voxels;
- providing a labeled volume indicating tissue types of tissue corresponding to said voxels;
- correcting distortion of said first magnetic resonance modality volume;
- extracting magnetic property distribution parameters for each tissue type identified at each voxel; and
- recording magnetic property data corresponding to each tissue type in a node of said atlas corresponding to a voxel of said first magnetic resonance modality volume.

58. (original) The method of claim 57, further comprising the steps of:

- providing a plurality of magnetic resonance modality volumes pertaining to a plurality of subjects and each of said plurality of magnetic resonance modality volumes divided into voxels;
- providing a plurality of labeled volumes corresponding to said plurality of magnetic resonance modality volumes and indicating tissue types of tissue corresponding to said voxels;
- correcting distortion of each of said plurality of magnetic resonance modality volumes; and
- updating said magnetic property data in said node of said atlas corresponding to a voxel of each of said plurality of magnetic resonance modality volumes.

59.-68. (cancelled)

69. (new) An atlas implemented in software comprising:

a plurality of nodes corresponding to a plurality of voxels representing spatial locations of a subject, each of said nodes configured to store at least two magnetic property values for each of said voxels as determined by magnetic resonance imaging.

70. (new) The atlas of claim 69 in which the plurality of nodes represent the subject divided in three-dimensional space.

71. (new) The atlas of claim 69 in which one of said nodes corresponds to one of said voxels.

72. (new) The atlas of claim 69 in which said magnetic property values include T1 and T2 values.

73. (new) The atlas of claim 72 in which said magnetic property values also include a proton density value.

74. (new) The atlas of claim 69 in which said at least two magnetic property values represent different magnetic properties.

75. (new) The atlas of claim 69 in which said magnetic property values correspond to a tissue type at one or more voxels.

76. (new) The atlas of claim 69 in which said magnetic property values correspond to a first tissue type at one voxel and a second tissue type at a second voxel.

77. (new) An atlas implemented in software comprising:
a plurality of nodes corresponding to a plurality of voxels representing spatial locations of a subject, each of said nodes configured to store at least one magnetic property value as determined by magnetic resonance imaging and at least one tissue type prior probability value corresponding to a tissue type of a voxel.

78. (new) An atlas implemented in software comprising:
a plurality of nodes each configured to store values of a statistical representation of at least one magnetic property value as determined by magnetic resonance imaging and a statistical representation of at least one tissue type prior probability value corresponding to a tissue type for each of a plurality of corresponding voxels of a plurality of subjects.

79. (new) The atlas of claim 78 in which said statistical representation values include a mean and a variance of intensities of each of a plurality of magnetic property values at each corresponding voxel of said plurality of subjects.

80. (new) The atlas of claim 79 in which said mean and variance are determined for

each tissue type.

81. (new) An atlas implemented in software comprising:
a plurality of nodes each configured to store values of a statistical representation of at least two magnetic property values as determined by magnetic resonance imaging for each of a plurality of corresponding voxels of a plurality of subjects.

82. (new) The atlas of claim 81 in which said statistical representation values include a mean and a variance of intensities of each of a plurality of magnetic property values at each corresponding voxel of said plurality of subjects.

83. (new) The atlas of claim 81 further including at least one tissue type prior probability value corresponding to a tissue type for each of a plurality of corresponding voxels of a plurality of subjects.

84. (new) The atlas of claim 83 in which, for each of said tissue types, said mean and said variance of said magnetic property values at said spatial locations are determined.

85. (new) The atlas of claim 81 in which said values of a statistical representation are scanner-specific.

86. (new) The atlas of claim 81 in which said values of a statistical representation are acquisition-specific.

87. (new) The atlas of claim 81, wherein said values of a statistical representation contain magnetic resonance sequence parameters, including at least one from the group consisting of TR, TE and flip angle.

88. (new) An atlas implemented in software comprising:
a plurality of nodes corresponding to a plurality of voxels of at least one subject;
at least one node of said plurality of nodes configured to store a prior probability of a tissue type located at said voxel corresponding to said node and a statistical value of a magnetic property value of said tissue type located at said voxel corresponding to said node.

89. (new) The atlas of claim 88, in which in said statistical value comprises mean and variance.

90. (new) The atlas of claim 89 in which said voxels correspond to a plurality of subjects and a plurality of tissue types are located at said node and said statistical value is comprised of a plurality of statistical values calculated for each of said tissue types located at said voxel corresponding to said node.

91. (new) The atlas of claim 88 in which said voxels correspond to a plurality of subjects and a plurality of tissue types are located at said node and said statistical value is comprised of a plurality of statistical values calculated for each of said tissue types located at said voxel corresponding to said node.

92. (new) A system for obtaining information about a subject, the system comprising:

- a magnetic resonance scanner configured to obtain a magnetic resonance scan of said subject;
- an atlas including:
 - a plurality of nodes corresponding to a plurality of voxels representing spatial locations of a subject, each of said nodes configured to store at least two magnetic property values for each of said voxels as determined by magnetic resonance imaging, or at least one magnetic property value as determined by magnetic resonance imaging and at least one tissue type prior probability value corresponding to a tissue type of a voxel; and
 - a processor adapted to receive information from said scanner pertaining to said magnetic resonance scan and to read said atlas.

93. (new) A method for obtaining information about a subject, comprising the steps of:

- providing a magnetic resonance scanner;
- providing an atlas having magnetic resonance data including more than one magnetic property value prior probability derived from at least one other subject;
- processing information received from said scanner pertaining to said subject;
- reading said atlas; and
- determining alignment of said magnetic resonance scan to obtain a specific geometry of a subsequent magnetic resonance scan.

94. (new) The method of claim 93 further comprising the steps of:
communicating alignment data from said processor to said scanner; and
automatically aligning said magnetic resonance scan to obtain said specific
geometry of a subsequent magnetic resonance scan by the use of said alignment data.

95. (new) The method of claim 93, wherein said step of providing an atlas having
magnetic property values derived from at least one other subject involves data derived from a
plurality of subjects.